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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/943,765	08/30/2001	Vernon M. Williams	4303.1US (99-0584.1)	2595
24247	7590	11/25/2003	EXAMINER	
TRASK BRITT P.O. BOX 2550 SALT LAKE CITY, UT 84110			DAVIS, ROBERT B	
			ART UNIT	PAPER NUMBER

1722

DATE MAILED: 11/25/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

### Office Action Summary

Application No.

09/943,765

Applicant(s)

WILLIAMS, VERNON M.

Examiner

Robert B. Davis

Art Unit

1722

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 15 September 2003.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 3, 7, 12, 15, 16, 18 and 20-24 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 3, 7, 12, 15, 16, 18 and 20-24 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.  
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

#### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

***Response to Amendment***

***Claim Rejections - 35 USC § 112***

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 3, 7, 12, 15, 16, 18 and 20-24 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The independent claims 3, 7 and 12 have been amended to recite "wherein said at least one cavity includes at least one surface with recesses formed therein, each of said recesses having an imperforate boundary wall that is sized and configured to at least partially substantially conformally receive one of a plurality of conductive structures protruding from a substrate positionable in said at least one cavity." This part of the claims as amended includes two instances of new matter not supported by the original specification. The first instance is the limitation "imperforate boundary wall" and the second instance is "boundary wall that is sized and configured to at least partially substantially conformally receive one of a plurality of conductive structures." The original specification recites in paragraph 31 as listed by applicant for support for these amendments the following:

Additionally, the second half 14" of the transfer mold 5" may include a plurality of recesses 58 formed in and configured to receive portions of conductive structures 56 so as to prevent resin 24 from completely covering same.

There is nothing in this sentence to support the recesses being imperforate or the recesses being sized and configured to at least partially substantially conformally receive one of the plurality of conductive structures. Applicant has support for the recesses configured to receive portions of conductive structures so as to prevent resin from completely covering same.

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 3, 7, 12, 15, 16, 18 and 20-24 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The phrase "said recesses having an imperforate boundary wall that is sized and configured to at least partially substantially conformally receive" is indefinite as it is unclear what the phrase "at least partially substantially conformally receive" means. It is unclear how something can partially substantially conform.

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 3, 7, 12, 15, 16, 18 and 20-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over 2. Claims 3, 7, 12, 15, 16, 18, 20 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsuji et al (5,293,072: figures 3A, 3B, 4F and 5; and column 3, line 66 to column 4, line 44) taken together with Japanese reference (6-151,492: figures 1 and 7-9 and abstract).

Tsuji et al disclose a two part mold (43) having a first molding member (43a) and a second molding member (43b) forming cavities (43c, 43d), wherein the second molding member has a plurality recesses (45) to accommodate conductive structures (33) during the molding step to form a product as shown in figures 3A and 3B which has the conductive structures protruding from the molded resin (32). The reference clearly teaches a plurality of recesses (45) for supporting conductive structures (33) such that the encapsulating resin does not completely cover the conductive structures. The reference does not disclose the molding cavity having a vertical orientation.

The Japanese reference (-492) discloses an encapsulation mold comprising: first and second mold members (1, 2) having a cavity (13) therebetween extending in a vertical direction as shown in figures 7-9, an injection gate (11) formed at the bottom of the cavity and a vent (7) positioned at the top of the cavity. The reference further teaches a plurality of molding cavities per mold member as shown in figure 1. The vent (7) at the top of the molding cavity (13) allows for air bubbles present in the resin injected into the bottom of the cavity to escape to prevent the formation of voids in the molded product to reduce the number of defective products produced by the apparatus.

It would have been obvious at the time of the invention to one of ordinary skill in the art to modify the apparatus of Tsuji et al by positioning the cavity vertically such that the injection gate is positioned at the bottom of the cavity and a vent is positioned at the top of the cavity as disclosed by the Japanese reference (-492) for the purpose of preventing the formation of voids by suppressing the resistance to filling of the molding cavity by changing the orientation of the cavity. It would have been further obvious to modify the mold of Tsuji et al to form a plurality of articles simultaneously as disclosed by the Japanese reference (-492) for the purpose of increasing the number of products produced. In regards to claims 22-24, it would have been further obvious to modify the shape of the recesses to support pillars or columns such that the entire pillar or column was not covered by encapsulating resin.

7. Claims 3, 7, 12, 15, 16, 18 and 20-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Orcutt (6,187,612: figures 1-3 and column 2, lines 7-51) taken together with Japanese reference (6-151,492: figures 1 and 7-9 and abstract).

Orcutt discloses a two part mold having a first molding member (7) and a second molding member (1) forming cavities, wherein the second molding member has a plurality recesses (3) to accommodate conductive structures (5) during the molding step to form a product as shown in figures 2a and 2b which has the conductive structures protruding from the molded resin (13). The reference clearly teaches a plurality of recesses (3) for supporting conductive structures (5) such that the encapsulating resin does not completely cover the conductive structures either by merely using a recess (3-

figure 1) or a recess (3) having a film (15) thereon as shown in figure 3. The reference does not disclose the molding cavity having a vertical orientation.

The Japanese reference (-492) discloses an encapsulation mold comprising: first and second mold members (1, 2) having a cavity (13) therebetween extending in a vertical direction as shown in figures 7-9, an injection gate (11) formed at the bottom of the cavity and a vent (7) positioned at the top of the cavity. The reference further teaches a plurality of molding cavities per mold member as shown in figure 1. The vent (7) at the top of the molding cavity (13) allows for air bubbles present in the resin injected into the bottom of the cavity to escape to prevent the formation of voids in the molded product to reduce the number of defective products produced by the apparatus.

It would have been obvious at the time of the invention to one of ordinary skill in the art to modify the apparatus of Orcutt by positioning the cavity vertically such that the injection gate is positioned at the bottom of the cavity and a vent is positioned at the top of the cavity as disclosed by the Japanese reference (-492) for the purpose of preventing the formation of voids by suppressing the resistance to filling of the molding cavity by changing the orientation of the cavity. It would have been further obvious to modify the mold of Orcutt to form a plurality of articles simultaneously as disclosed by the Japanese reference (-492) for the purpose of increasing the number of products produced. In regards to claims 22-24, it would have been further obvious to modify the shape of the recesses to support pillars or columns such that the entire pillar or column was not covered by encapsulating resin.

***Response to Arguments***

8. Applicant's arguments filed 9/15/03 have been fully considered but they are not persuasive. Applicant argues that the combination of Tsuji et al and the Japanese reference (-492) fail to teach all claimed features in particularly the recesses having an imperforate boundary wall that is sized and configured to at least partially substantially conformally receive one of the plurality of conductive structures. The examiner respectfully disagrees as this limitation is not fully supported by the original specification and constitutes new matter. Second, the Orcutt reference has been applied to show an imperforate recess that prevents complete covering during encapsulation. Applicant further argues that there is no suggestion to combine the references of Tsuji et al and the Japanese reference (-492); however, the examiner respectfully disagrees as each of these references clearly is within the field of encapsulating semiconductor devices in a mold and the Japanese reference (-492) clearly provides motivation in the form of allowing air and volatiles to vent from the cavity by injecting the resin into the bottom of the cavity and providing a vent at the top of the mold. It is clear that one of ordinary skill in the art would recognize the benefit of orienting the mold part line along the vertical axis to help eliminate air and volatiles from the mold of either Tsuji et al or Orcutt for the purpose of eliminating voids and other molding defects. The arguments concerning a reference lacking a reference that teaches providing the mold in either the vertical or horizontal orientation is not understood as the Japanese reference clearly shows a parting line in the horizontal orientation in figures 8, 9, 13 and 14 and a mold with a parting line in the vertical orientation in figures 1-7.



***Conclusion***

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Robert B. Davis whose telephone number is 703-308-2625. In December, the examiner's number will change to 571-272-1129. The examiner can normally be reached on Monday-Friday 9-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wanda L. Walker can be reached on 703-308-0457. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.



Robert B. Davis  
Primary Examiner  
Art Unit 1722

11/19/2007